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ABSTRACT

The effects of financial aid on persistence to Bachelor's degree were studied using data from the national longitudinal Beginning Postsecondary Student Survey for 1989-90 freshmen. The subsample of 3,188 students were enrolled full-time in four-year institutions; persistence was defined as attainment of the Bachelor's degree from the institution in which the student initially enrolled within 5 years. Descriptive statistics and path analysis were employed to examine the influence of different amounts, types (loans, grants, and/or work study), and combinations of financial aid. Findings suggest that receiving financial aid is not directly related to completing a Bachelor's degree within 5 years. However, the effectiveness of financial aid may depend upon the type and package of aid received; work study and grant-only aid packages both seemed to have positive direct effects upon persistence. The results also suggest that the effects of financial aid are primarily exerted indirectly through college grades. Analyses also suggest a negative effect: students who receive loans are less likely to complete their degrees within 5 years than their counterparts who do not receive financial aid. Findings also show that while the number of hours worked is unrelated to degree completion, work study aid increases degree completion rates. (Contains 53 references.) (SW)

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THE CONTRIBUTION OF FINANCIAL AID TO UNDERGRADUATE PERSISTENCE

by

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This paper was presented at the annual meeting of the Association for the Study of Higher Education held in Albuquerque, New Mexico, November 6-9, 1997. This paper was reviewed by ASHE and was judged to be of high quality and of interest to others concerned with higher education. It has therefore been selected to be included in the ERIC collection of ASHE conference papers.

More than $55.7 billion in financial aid was awarded by federal, state, and institutional sources to postsecondary education students and their parents in 1996-97, an increase of 70% over the past decade. Loans now represent 60% of all aid, up from 50% ten years and only 20% twenty years ago (The College Board, 1997). From a public policy perspective, providing a current assessment of the effectiveness of financial aid is warranted, in part, because of these changes.

One of the goals of the student financial aid programs authorized under the Higher Education Act of 1965 is to ensure equal educational opportunity for all academically qualified citizens regardless of their economic status. Equal educational opportunity has been interpreted to include not only access to enter postsecondary education and choice among the variety of American postsecondary educational institutions, but also persistence through graduation in the institution selected (Fife, 1975; Hansen, 1989; Scannell, 1992; Fenske and Gregory, 1994). This study provides a current assessment of the effectiveness of financial aid in achieving one aspect of equal educational opportunity, persistence through graduation in the institution selected. Because financial aid is only one factor which influences persistence, this study addresses the following question: What are the total, direct, and indirect effects of receiving financial aid, the amount of financial aid received, and the types of financial aid received on persistence to bachelor's degree completion after controlling for other factors?

REVIEW OF PRIOR RESEARCH

The three purposes of this literature review are: 1) to describe the conceptual frameworks that have guided research on student persistence; 2) to examine what has been learned from prior research about the effects of financial factors, including financial aid, on persistence; and 3) to describe the contribution of this study to knowledge about the effects of financial aid on student persistence.

Conceptual Framework

Researchers have used economic and sociological frameworks to examine student persistence. According to economic approaches such as those employed by Iwai and Churchill (1982) and Voorhees (1984), an individual decides to persist at an institution by comparing the costs and benefits of persisting with the costs and benefits of various alternatives, such as dropping out and working full-time or transferring to another institution. Bean (1980, 1983) has used a model from organizational sociology that emphasizes the role of institutional attributes (e.g., size, structure, faculty-student ratio, resources, goals) in the socialization and satisfaction of students and that minimizes the role of individual attributes.

The conceptual framework used in this study is a modified version of Tinto's (1975, 1987, 1993) theory of voluntary student departure. According to Tinto, student departure is typically the consequence of various interactions between individual students who have particular background characteristics, attributes and skills and other members of the academic and social systems of the institution. Activities that facilitate an individual's academic and social involvement in an institution increase the likelihood of persisting by increasing the individual's commitment to the institution and to the goal of completing college. Unlike economic models which emphasize the role of finances and financial aid, Tinto's model allows for other explanations for student departure. Tinto's model also improves upon models based in organizational sociology by recognizing that the effects of institutional attributes depend upon an individual student's intentions and attributes. Other researchers (e.g., Cabrera, Nora, Castañeda, 1992) have modified Tinto's model to explore the effect of finances on the persistence process.

Effects of Financial Aid on Undergraduate Student Persistence

Financial difficulty is commonly reported by students to be a primary reason for leaving an institution (Astin, 1975; Pantages & Creedon, 1978; Wenc, 1983), particularly among first-generation

college students (Billson & Terry, 1982). Inadequate financial aid may have a larger effect among students attending four-year private institutions than for students attending two-year public institutions (Beal & Noel, 1980). Nonetheless, several researchers (Pantages & Creedon, 1978; Wenc, 1983; Braxton, Brier & Hossler, 1988; Woodward, 1988) have argued that "financial difficulty" likely represents a socially acceptable reason for leaving an institution rather than a true cause.

Prior research generally shows that recipients and non-recipients of financial aid persist at comparable rates (e.g., Bergen & Zielke, 1979; McCreight & LeMay, 1982; Murdock, 1987; Stampen & Cabrera, 1988; Stampen & Fenske, 1988; Pascarella & Terenzini, 1991; Jones & Moss, 1994), suggesting that financial aid eliminates the negative effects of inadequate financial resources and provides low-income students with equal opportunity to complete their degrees. Persistence rates of aid recipients and non-recipients will not differ if financial aid reduces the financial reasons for withdrawing among aid recipients, assuming that financial aid is distributed based upon financial need (Murdock, 1987; Stampen & Cabrera, 1988).

Several researchers (e.g., Terkla, 1985; Cabrera, Nora et al, 1992) have used causal modeling techniques to show that financial aid has a positive total effect upon persistence. Using a subsample from the National Longitudinal Study of the high school class of 1972, Terkla found that receiving financial aid had the third largest direct effect and the fifth largest total effect on persistence after controlling for background characteristics, pre-college academic factors, occupational and educational aspirations, college performance, and institutional characteristics. Cabrera, Nora et al (1992) found that, among full-time, unmarried, dependent 1988 freshmen attending one public commuter institution, receiving financial aid had the third largest total effect on persisting to the second year, with only intent to persist and cumulative grade point average having larger total effects. After controlling for satisfaction with financial support, pre-college academic performance, college grade point average, social integration,

institutional commitment, goal commitment, and intent to persist, receiving financial aid increased persistence only indirectly through cumulative grade point average (Cabrera, Nora et al, 1992).

After controlling for student background characteristics and college experiences, work study aid (Astin, 1975) and other part-time employment (Astin, 1975; Bers & Smith, 1991) have been shown to increase persistence, but full-time employment (Astin, 1975) and off-campus employment (Astin, 1975; Pascarella & Terenzini, 1991) have been found to decrease persistence rates. Hall (1990) found that, among a sample of freshmen attending one university in 1980, persistence rates declined as the number of hours worked increased both directly and indirectly through cumulative grade point average. In contrast, Peng & Fetters (1978) found that, among a subsample from the National Longitudinal Study of the high school class of 1972, persistence rates increased with the number of hours worked.

The effect of grants on undergraduate persistence is ambiguous. Based upon their separate reviews of prior research, Pantages and Creedon (1978) and Jensen (1983) concluded that grants increase persistence. Astin (1975) found that, among 1968 freshmen attending two- and four-year institutions nationwide, scholarships and grants were the second most effective type of financial aid after work study although the effect of grants varied by income and other aid received. In contrast, other researchers have found grant and scholarship aid to be unrelated to persistence (Peng & Fetters, 1978; Moline, 1987).

The effect of loans on persistence is also equivocal. Based upon their respective reviews of prior research, Jensen (1983) and Pantages and Creedon (1978) concluded that receiving loans was unrelated to persistence. Using a subsample from the National Longitudinal Study of the high school class of 1972, Peng and Fetters (1978) also found that loans were unrelated to persistence. Astin (1975) showed that rates of persisting from the first to the second year were lower for men who received loans than for men who did not receive loans. For women, receiving loans reduced persistence rates only for those from middle-income families and for those for whom loans constituted a "major" source of support.

Several researchers have examined the effects of different combinations or "packages" of financial aid. Iwai and Churchill (1982) used difference of means tests to show that students at one institution in fall 1975 who returned for the spring term relied upon a greater number of sources of financial support (e.g., parental aid, personal savings, summer work, spousal support, part-time work, loans, scholarships) than those who did not return regardless of grade point average and class year. Jensen (1984) found that, among 1970 freshmen attending one institution, the probability of attaining a bachelor's degree by 1975 was higher when the financial aid package included grants, loans, and work study. Astin (1975) found the effects of any one type of aid generally declined when more than one type of aid was received.

The effects of different combinations of aid may vary by class year (St. John, Kirshstein & Noell, 1991). After controlling for background, academic ability, high school curricular track, institutional type, enrollment status, and college grades, receiving only loans increased persistence from the first to the second year by 4.7% and from the third to the fourth year by 5.3%, but was unrelated to persistence from the second to the third year. Receiving grants and loans increased persistence from the first to the second year by 5.4% and from the second to the third year by 10.6%. Receiving grants, loans, and work study increased the probability of persisting from the second to the third year by 10.2%.

Both campus based and non-campus based sources of financial support have been shown to increase persistence rates. Voorhees (1985) found that, among 343 freshmen attending one university who received campus based aid (College Work Study, Perkins Loans, and Supplemental Opportunity Grants), the most important predictors of persistence through the first three terms were, in order of importance, Perkins Loans (then called National Direct Student Loans), College Work Study, and non-campus based loans. Among first-time 1982 Chicano freshmen attending one community college who received financial aid, Nora (1990) found that non-campus based resources had the largest direct and total

effects on retention and campus based aid had the second largest total effect. About 50% of the effect of campus based aid was exerted indirectly through cumulative grade point average.

Single institution studies have generally shown that the amount of financial aid received is unrelated to persistence (McCreight & LeMay, 1982; Jensen, 1984; Moline, 1987), likely due to the lack of variance in unmet financial need (McCreight & LeMay, 1982). But, using a national sample of 1980 high school seniors, St. John (1990) found that year-to-year persistence increased with the amounts of grants, loans, and work study received after controlling for class year, background characteristics, high school curricular track, ability, educational aspirations, institutional characteristics, and grades.

Contribution of this Research to Knowledge about the Effects of Aid on Persistence

This study builds upon the strengths and addresses the weaknesses of prior research in at least four ways. First, prior research has shown that students who receive financial aid persist at both a higher rate (Terkla, 1985) and a rate comparable to that of non-recipients (Bergen and Zielke, 1979; McCreight and LeMay, 1982; Murdock, 1987; Stampen and Cabrera, 1988; Stampen and Fenske, 1988; Jones and Moss, 1994), suggesting that financial aid has eliminated the negative effects of financial need upon persistence. Prior research does not conclusively reveal, however, the extent to which the effects of financial aid vary based upon the amount, types, and combinations of aid received. Moreover, as some (e.g., Stampen & Fenske, 1988; Cabrera, Stampen & Hansen, 1990) have observed, many studies examining the role of finances on persistence have focused upon the direct effect of financial aid upon persistence rather than on the ways in which financial aid influences the persistence process (e.g., Bergen & Zielke, 1979; McCreight & LeMay, 1982; Woodward, 1988; St. John, 1990; St. John et al, 1991; Jones & Moss, 1994). The current study utilizes path analysis to examine the ways in which different amounts, types, and combinations of financial aid influence the persistence process.

Second, the influence of financial aid on persistence necessarily reflects the characteristics of the aid programs in place at the time of the study, particularly in terms of eligibility requirements and the types and amounts of aid available. Continual changes in other social, demographic, and economic factors further limit the relevance of prior research to a particular time period. Because the emphasis of federal financial aid programs has shifted from grants to loans over the past two decades (The College Board, 1997), assessing the current effects of different types of financial aid is particularly important.

Third, most examinations of the factors related to student persistence rely upon samples drawn from single institutions (e.g., Bergen and Zielke, 1979; Bean, 1980, 1983; McCreight & LeMay, 1982; Pascarella, Duby & Iverson, 1983; Jensen, 1984; Metzner and Bean, 1987; Moline, 1987; Braxton et al, 1988; Cabrera et al, 1990; Cabrera, Nora et al, 1992). Nonetheless, restricted variance in various factors (e.g., unmet financial need, family income) may produce statistically non-significant relationships regardless of the true relationship.

Fourth, this study utilizes the most recent and most reliable source of financial aid data available. No national student aid database existed prior to 1986/87 when the U.S. Department of Education initiated the first National Postsecondary Student Aid Survey. Consequently, some researchers omitted measures of financial aid from their analyses of persistence (e.g., Bean, 1980, 1983; Terenzini and Pascarella, 1980; Terenzini et al., 1985; Metzner & Bean, 1987; Braxton et al., 1988; Nora et al, 1990; Bers & Smith, 1991; Hood, 1992) or examined students' attitudes about their financial support (e.g., financial security, satisfaction with financial support, certainty of finances, need to work) rather than the effects of actual financial aid received (e.g., Bean, 1980; Pascarella et al, 1983; Metzner & Bean, 1987; Cabrera, 1988; Cabrera et al, 1990; Mallette and Cabrera, 1991; Cabrera, Castañeda et al, 1992).

RESEARCH DESIGN

This study uses descriptive and path analyses to examine the effects of financial aid on persistence to bachelor's degree completion by employing a subsample from the most recent, national longitudinal database with reliable financial aid data available, the Beginning Postsecondary Student Survey (BPS) of 1989-90 freshmen. Because prior research has not provided a current assessment of the influence of different amounts, types, and packages of financial aid on persistence, the path analyses are repeated using each of four different measures of financial aid.

Sample

A subsample from the second follow-up to the BPS is used to examine the research question. For the BPS, 7,253 first-time postsecondary students who participated in the National Postsecondary Student Aid Study in 1990 were followed up in 1992 and 1994. The subsample used in this study includes the 3,188 students with data for persistence who meet the following criteria: initially enrolled in a four-year college or university on a full-time basis, financially dependent, and American citizen. In order to correct for the influence of large sample sizes on standard errors and t-tests, the sample is weighted by the sample weight divided by the average weight for the sample. The size of the weighted sample is 796,925 and the size of the adjusted weighted sample used in these analyses is 3,188.

Research Method

Descriptive and path analyses are used to examine the research question. Descriptive statistics, such as chi-square and ANOVA, are used to identify the characteristics of students who are and are not persisting to graduation. Path analysis is employed to determine the total, direct, and indirect effects of financial aid upon persistence after controlling for other important factors related to persistence. Because prior research has not adequately measured the effects upon student persistence of different amounts,

types, and packages of financial aid and because the amounts, types, and packages of aid available to students have changed over time, the path analyses are repeated using each of four different measures of financial aid. The four specifications are: 1) received financial aid (yes/no); 2) amount of aid received; 3) type of aid received (e.g., loans, grants, and/or work study); and 4) package of aid received (e.g., grants only, grants and loans).

Variables

Persistence is defined as attainment of the bachelor's degree from the institution in which the student initially enrolled by May 1994, five years after initially enrolling. Students who left the institution without returning or who transferred to another institution are classified as non-persisters.

The hypothesized predictors of persistence are drawn from the review of prior research and are based upon the variables available in the BPS database. In addition to financial aid, the exogenous variables include measures of background characteristics, encouragement of significant others, initial intentions, initial institutional commitment, campus experiences, and institutional characteristics. The four endogenous variables are grade point average, academic integration, social integration, and persistence to bachelor's degree completion at the initial institution attended.

Background characteristics

Most researchers have found that sex is unrelated to the probability of persisting (Pascarella & Chapman, 1983; Terenzini et al, 1985; Terkla, 1985; Willingham, 1985; Metzner & Bean, 1987; Moline, 1987; Braxton et al, 1988; St. John, 1990; Bers & Smith, 1991). Nonetheless, Pantages and Creedon (1978) concluded from their review of prior research that, although sex has been shown to be unrelated to persistence, men and women report different reasons for leaving. Because women tend to leave for non-academic reasons (e.g., personal concerns) and men tend to leave for academic reasons, Pantages and

Creedon recommended that sex be considered when evaluating the effects of academic, environmental, institutional, and longitudinal factors on persistence.

Examinations of the effect of race on persistence are limited by the omission of race from the analysis (e.g., Bean, 1980; Nora et al, 1990; Mallette & Cabrera, 1991; Cabrera, Nora et al, 1992) and the aggregation of non-Whites into one group (e.g., Pascarella et al, 1983; Pascarella & Terenzini, 1983; Terkla, 1985; Willingham, 1985; Metzner & Bean, 1987; Braxton et al, 1988). A few researchers have shown that Black students (Stampen & Fenske, 1988; Arbona & Novy, 1990) and non-White students (Willingham, 1985) are less likely than White students to persist. Other researchers have found that race influences persistence only indirectly (Pascarella & Terenzini, 1983; Pascarella et al, 1983; Terenzini et al, 1985; Terkla, 1985; Metzner & Bean, 1987; St. John, 1990; St. John et al, 1991). In this study, dichotomous variables are used to examine the effects on persistence of four racial/ethnic groups: White, Black, Hispanic, and other. White is the reference group in the analyses.

The effect of socioeconomic status on persistence is ambiguous. Reviews of prior research (Pantages & Creedon, 1978; Terenzini & Pascarella, 1980) and single institution studies (Bean, 1980; Pascarella et al, 1983; Pascarella & Chapman, 1983; Pascarella & Terenzini, 1983; Terenzini et al, 1985; Moline, 1987; Braxton et al, 1988; Nora, Attinasi & Matonak, 1990) have generally shown that socioeconomic status is not directly related to persistence. The effect of socioeconomic status has been found to be mediated by such factors as institutional size, living on campus, academic integration, social integration, and institutional commitment (Terenzini & Pascarella, 1980; Pascarella & Chapman, 1983), initial institutional commitment (Pascarella & Terenzini, 1983; Terenzini et al, 1985), and initial commitments and academic integration (Nora et al, 1990). Researchers who have used national or regional samples of students (Astin, 1975; Terkla, 1985; Cabrera, 1988; Cabrera et al, 1990; St. John, 1990) have found persistence rates to increase with family income and other measures of socioeconomic status, suggesting that financial aid is not sufficient to mitigate the negative influence on persistence of

limited financial resources (St. John, 1990). In this study, the effects of persistence of the 2nd, 3rd, and 4th socioeconomic status quartiles are assessed relative to the lowest socioeconomic status quartile.

A number of researchers have shown that pre-college academic performance (measured by high school rank, SAT, and other test scores) is not directly related to college persistence (Willingham, 1985; Cabrera, 1988; Arbona & Novy, 1990; Cabrera et al, 1990; Cabrera, Nora et al, 1992), but influences persistence indirectly through other factors in the model (Bean, 1980; Pascarella & Terenzini, 1983; Terenzini et al, 1985; Metzner & Bean, 1987; Moline, 1987). Reviews of prior research (Pantages & Creedon, 1978; Stampen & Fenske, 1988) and some researchers (Terkla, 1985) have shown, however, that pre-college academic performance is one of the most important predictors of college persistence. Some studies showing a positive relationship between high school academic performance and persistence are limited by the failure to control for college academic performance (e.g., Astin, 1975; Jensen, 1984; Johnson, 1994).

Admissions test scores are the only measure of pre-collegiate academic achievement available in the database. But, even after converting available ACT scores to SAT scores, 35% of the cases have no test score data. For students who are missing both SAT and ACT scores, the average SAT/ACT equivalent score for students of the same socioeconomic status quartile and racial group is used. Calculating test scores based on both socioeconomic status and racial group is important since higher percentages of Blacks and Hispanics than of Whites are missing these data, and because an analysis of variance test shows that the average test score varies by both socioeconomic status and racial group.

Encouragement of significant others

Some researchers have found that encouragement of significant others directly increases the probability of persisting (Cabrera, 1988; Cabrera et al, 1990). When measured as parental approval of the institutional choice (Cabrera, Castañeda et al, 1992), encouragement of friends to stay in school

(Metzner & Bean, 1987), and encouragement of significant others (Nora et al, 1990; Cabrera, Nora et al, 1992), other researchers have found that the effect of significant others is mediated by other factors. In this study, parents' highest level of education is used as a proxy for parental encouragement.

Initial goals and commitments

Educational aspirations have been shown to be among the most important predictors of persistence (Astin, 1975; Peng & Fetters, 1978; Terkla, 1985; St. John, 1990; Bers & Smith, 1991; St. John et al, 1991). Some researchers, however, have found educational aspirations to be only indirectly related to persistence (Metzner & Bean, 1987; Cabrera, Castañeda et al, 1992; Cabrera, Nora et al, 1992) or unrelated to persistence (Pascarella et al, 1983). In this study, educational aspirations are measured by the dichotomous variable expect to earn more than a bachelor's degree (yes/no).

Studies that control for "intent to persist" generally show that institutional commitment is related to persistence only indirectly (Pascarella et al, 1983; Cabrera, Castañeda et al, 1992; Cabrera, Nora et al, 1992), whereas studies that do not control for intent to persist typically show that institutional commitment is one of the most important predictors of persistence (Bean, 1980; Pascarella & Terenzini, 1983; Terenzini et al, 1985; Mallette & Cabrera, 1987; Braxton et al, 1988). In this study, the only measure of institutional commitment available in the BPS database is whether a student is attending the first-choice institution.

Institutional characteristics

Prior research has shown that persistence rates are higher for students attending more rather than less selective institutions (Willingham, 1985; Pascarella & Terenzini, 1991). The effect of institutional size on persistence is inconclusive (Pantages & Creedon, 1978; Pascarella & Terenzini, 1991), with some researchers showing the effect of institutional size on persistence to be mediated by other factors

(Pascarella & Chapman, 1983). In this study, institutional selectivity is measured by the selector level assigned in Barron's Profiles of American Colleges. Based on this rating, institutions are grouped into one of three categories: very competitive, competitive, and less competitive. Institutional size is measured by total enrollment.

Integration and involvement in the institution

Although some researchers have included college academic performance in composite measures of academic integration, others have examined the effects of college academic performance separately. A few researchers have found that college academic performance is not directly related to undergraduate persistence after controlling for other factors (Terkla, 1985; Willingham, 1985; Cabrera, Castañeda et al, 1992). Most researchers, however, have found that college grade point average is among the single most important predictors of persistence (Peng & Fetters, 1978; Bean, 1983; Metzner & Bean, 1987; Moline, 1987; Cabrera, 1988; Cabrera et al, 1990; Hall, 1990; St. John, 1990; St. John et al, 1991; Cabrera, Nora et al, 1992). In this study, college grades are measured by first-year cumulative grade point average, when available, and cumulative grade point average for the entire period attended when first-year grade point average is missing (17% of cases).

The effects of academic integration on persistence likely depend upon the operationalization of the measure and the sample used although some seemingly different measures have been found to have quite similar effects (Cabrera, Castañeda et al, 1992). Measures of contact and/or satisfaction with faculty have been found to be positively related (Pantages & Creedon, 1978; Terenzini & Pascarella, 1980), indirectly related (Metzner & Bean, 1987), and unrelated (Cabrera, 1988; Cabrera et al, 1990) to persistence. Some researchers have found factor composites that include such items as first-term grade point average, expected future grade point average, hours spent studying, number of unassigned books read, number of cultural events attended, informal contact with faculty on academic topics, peer

conversations on academic topics, participation in honors program, and participation in career development programs (Pascarella & Chapman, 1983) to be unrelated to persistence. Other researchers have found persistence to increase with academic integration when measured as a composite of perceptions of academic experiences, frequency of academic involvement, frequency of study behavior, and grade point average (Nora et al, 1990), as the sum of first-year grade point average, perceived level of intellectual development, perceived faculty concern for quality teaching, and frequency of non-classroom contacts with faculty (Pascarella et al, 1983), or as a composite of anticipated academic performance, satisfaction with the academic experience, and actual academic performance (Cabrera, Castañeda et al, 1992).

Single institution studies have generally shown social integration to be unrelated to persistence, regardless of whether measured as peer-group relations (Mallette & Cabrera, 1991; Cabrera, Nora et al, 1992), participation in extracurricular activities (Pantages & Creedon, 1978), membership in campus organizations (Bean, 1983; Metzner & Bean, 1987), or number of close friends at the institution (Bean, 1983; Metzner & Bean, 1987). Among a national sample of students, persistence has been found to increase with satisfaction with social life (Cabrera, 1988; Cabrera et al, 1990). Other evidence suggests that social integration has a positive effect on persistence for students attending four-year residential institutions, but a negative or non-significant effect for students attending commuter institutions (Pascarella & Chapman, 1983; Pascarella et al, 1983; Pascarella & Terenzini, 1991) or community colleges (Nora et al, 1990).

In this study, factor analysis is used to construct parsimonious measures of academic integration and social integration using existing variables in the database. Table 1 presents the variables comprising these factors and the factor loadings.

Other factors related to student involvement in the institution that are included in these analyses are campus residence, distance from home, and number of hours worked. Living on-campus has been

found to increase persistence (Pantages & Creedon, 1978; Pascarella & Terenzini, 1991), especially among students attending four-year residential institutions (Pascarella & Chapman, 1983). In this study, two proxies are used for students' place of residence: living in campus housing (yes/no) and distance of the institution from home.

Figure 1. Predictors of Persistence to Bachelor's Degree Completion

Table 1. Factor loadings for measures of academic integration and social integration

Variable	Academic Integration	Social Integration
Contact with faculty outside of classroom	.415	-.030
Met with advisor about academic plans	.486	-.116
Talked with faculty about academic matters	.461	-.057
Participated in school clubs	-.011	.392
Went places with friends from school	-.130	.429
Participated in intramural activities	-.108	.445
In study groups with other students	.087	.285
alpha reliability coefficient	.56	.55

FINDINGS

Descriptive Analyses

Table 2 compares the characteristics of 1989-90 dependent first-time full-time freshmen who did and did not complete bachelor's degrees at the initial institution within five years of enrolling. Table 3 shows the percentage of 1989-90 freshmen who completed bachelor's degrees by the amount, types, and combinations of financial aid received.

Overall, 48.3% of 1989-90 full-time dependent freshmen completed bachelor's degrees within five years at the institution in which they initially enrolled. The descriptive analyses show that bachelor degree completion rates were higher for women than for men (52.5% versus 43.6%) and lower for Blacks (39.7%) than for Whites (48.7%). Degree completion rates appeared to increase with socioeconomic status, rising from 40.8% for those in the lowest socioeconomic status quartile to 55.6% for those in the highest quartile, and parental level of education, rising from 36.5% for students whose parents have not

completed high school to 57.5% for students whose parents have completed advanced degrees. More than one-half (54.6%) of students who expected to earn more than a bachelor's degree graduated within five years, compared with only 36.8% of students who expected to earn no more than a bachelor's degree. SAT scores (979 versus 915), college grades (2.85 versus 2.40), academic integration scores (0.07 versus -0.06) and social integration scores (0.16 versus -0.15) were higher for students who completed bachelor's degrees within five years than for students who did not. Degree completion rates were also higher for students who worked between one and 15 hours per week while enrolled (53.0%) and for students who lived on campus (54.8%) than for students overall (48.3%). More than one-half of students whose homes were more than 50 miles from campus completed their degrees within five years, compared with only 31.8% of students whose homes were 5 or fewer miles from campus. Nearly two-thirds (63.7%) of students attending very competitive colleges and universities graduated within five years, compared with 46.1% of students attending competitive and 36.0% of students attending less competitive institutions. Neither the size of the institution nor attending the first choice institution were related to bachelor's degree completion.

Table 3 shows that bachelor's degree completion rates were also higher for students who received financial aid than for students who did not receive aid (51.7% versus 43.8%). On average, students who completed their degrees within five years of initially enrolling received higher amounts of financial aid than students who did not ($5,090 versus $4,235). Among aid recipients, receiving grants was not related to degree completion. Degree completion rates were lower for aid recipients who received loans than for aid recipients who did not receive loans (48.2% versus 55.1%), but higher for aid recipients who received work study than for aid recipients who did not receive work study (58.9% versus 49.6%). The highest bachelor's degree completion rates were associated with packages of aid limited to only grants (55.7%) and packages of aid comprised of grants, loans, and work study (58.6%).

Table 2. Characteristics of 1989-90 freshmen who completed a bachelor's degree within five years at the institution in which initially enrolled

Characteristic	Total	Attained Bachelor's: Yes	Attained Bachelor's: No	Test of Statistical Significance
Total	100.0%	48.3%	51.7%	
	3,189	1,540	1,649	
Sex				$\chi 2 = 25.5$, df = 1, $p < .001$
Male	100.0%	43.6%	56.4%	
	1,514	660	854	
Female	100.0%	52.5%	47.5%	
	1,675	880	795	
Racial/ethnic group				$\chi 2 = 14.1$, df = 3, $p = .003$
White	100.0%	48.7%	51.3%	
	2,701	1,316	1,385	
Black	100.0%	39.7%	60.3%	
	229	91	138	
Hispanic	100.0%	43.5%	56.5%	
	131	57	74	
Other	100.0%	59.3%	40.7%	
	123	73	50	
Socioeconomic status				$\chi 2 = 44.4$, df = 3, $p < .001$
Lowest Quartile	100.0%	40.8%	59.2%	
	669	273	396	
2nd Quartile	100.0%	43.6%	56.4%	
	864	377	487	
3rd Quartile	100.0%	52.2%	47.8%	
	891	465	426	
Highest Quartile	100.0%	55.6%	44.4%	
	764	425	339	
SAT/ACT Score				$F = 126.3$, df = 1, 3185, $p < .001$
	946	979	915	
	3,187	1,539	1,648	
Expect to earn more than bachelor's degree				$\chi 2 = 90.4$, df = 1, $p < .001$
No	100.0%	36.8%	63.2%	
	1,092	402	690	
Yes	100.0%	54.6%	45.4%	
	2,043	1,116	927	

Table 2. Characteristics of 1989-90 freshmen who completed a bachelor's degree within five years at the institution in which initially enrolled (Continued)

Characteristic	Total	Attained Bachelor's: Yes	Attained Bachelor's: No	Test of Statistical Significance
Parents' level education				$\chi2 = 57.6$, df = 4, $p < .001$
Less than H.S.	100.0%	36.5%	63.5%	
	74	27	47	
H.S. graduate	100.0%	39.3%	60.7%	
	750	295	455	
Some postsecondary	100.0%	46.7%	53.3%	
	781	365	416	
Bachelor's degree	100.0%	51.5%	48.5%	
	802	413	389	
Advanced degree	100.0%	57.5%	42.5%	
	744	428	316	
First-choice institution				$\chi2 = .30$, df = 1, $p = .58$
No	100.0%	48.9%	51.1%	
	878	429	449	
Yes	100.0%	47.8%	52.2%	
	2,267	1,083	1,184	
Reside in campus housing				$\chi2 = 123.1$, df = 1, $p < .001$
No	100.0%	33.5%	66.5%	
	971	325	646	
Yes	100.0%	54.8%	45.2%	
	2,217	1,215	1,002	
Hours worked/week while enrolled				$\chi2 = 10.8$, df = 4, $p = .029$
Did not work	100.0%	49.7%	50.3%	
	678	337	341	
1 to 15 hours	100.0%	53.0%	47.0%	
	655	347	308	
16 to 20 hours	100.0%	46.7%	53.3%	
	409	191	218	
21 to 34 hours	100.0%	44.7%	55.3%	
	736	329	407	
35 or more hours	100.0%	47.2%	52.8%	
	709	335	374	

Table 2. Characteristics of 1989-90 freshmen who completed a bachelor's degree within five years at the institution in which initially enrolled (Continued)

Characteristic	Total	Attained Bachelor's: Yes	Attained Bachelor's: No	Test of Statistical Significance
Distance from home				$\chi 2 = 61.5$, df = 5, $p < .001$
5 miles or less	100.0%	31.8%	68.2%	
	242	77	165	
6-10 miles	100.0%	38.3%	61.7%	
	227	87	140	
11-50 miles	100.0%	45.2%	54.8%	
	841	380	461	
51-100 miles	100.0%	52.7%	47.3%	
	505	266	239	
101-500 miles	100.0%	51.7%	48.3%	
	1,046	541	505	
Over 500 miles	100.0%	59.3%	40.7%	
	290	172	118	
Institutional selectivity				$\chi 2 = 140.4$, df = 2, $p < .001$
Very competitive	100.0%	63.7%	36.3%	
	925	589	336	
Competitive	100.0%	46.1%	53.9%	
	1,319	608	711	
Less competitive	100.0%	36.0%	64.0%	
	838	302	536	
Institutional enrollment				F = .012, df = 1, 3176, p = .90
	13,393	13,419	13,368	
	3,189	1,540	1,649	
First-year grade point average				F = 304.2, df = 1, 3186, $p < .001$
	2.62	2.85	2.40	
	3,188	1,540	1,648	
Academic integration factor				F = 12.6, df = 1, 3142, $p < .001$
	0.00	0.07	-0.06	
	3,144	1,518	1,627	
Social integration factor				F = 78.2, df = 1, 3142, $p < .001$
	0.00	0.16	-0.15	
	3,144	1,518	1,627	

Table 3. Percentage of 1989-90 freshmen who completed a bachelor's degree within five years at the institution in which initially enrolled by financial aid received

Characteristic	Total	Attained Bachelor's: Yes	Attained Bachelor's: No	Test of Statistical Significance
Received financial aid				$\chi 2 = 19.1$, df = 1, $p < .001$
No	100.0%	43.8%	56.2%	
	1,369	600	769	
Yes	100.0%	51.7%	48.3%	
	1,818	939	879	
Average amount of aid				
Overall	2,668	3,105	2,259	F = 44.1, df = 1, 3186, $p < .001$
	3,188	1,540	1,648	
Aid Recipients Only	4,676	5,090	4,235	F = 24.8, df = 1, 1817, $p < .001$
	1,819	939	879	
Received loans				$\chi 2 = 8.6$, df = 1, $p = .003$
No	100.0%	55.1%	44.9%	
	913	503	410	
Yes	100.0%	48.2%	51.8%	
	906	437	469	
Received grants				$\chi 2 = .10$, df = 1, $p = .76$
No	100.0%	50.8%	49.2%	
	307	156	151	
Yes	100.0%	51.8%	48.2%	
	1,512	783	729	
Received work study				$\chi 2 = 10.6$, df = 1, $p = .001$
No	100.0%	49.6%	50.4%	
	1,425	707	718	
Yes	100.0%	58.9%	41.1%	
	394	232	162	

Table 3. Percentage of 1989-90 freshmen who completed a bachelor's degree within five years at the institution in which initially enrolled by financial aid received (Continued)

Characteristic	Total	Attained Bachelor's: Yes	Attained Bachelor's: No	Test of Statistical Significance
Aid package				$\chi 2 = 30.0$, df = 4, $p < .001$
Grants only	100.0%	55.7%	44.3%	
	672	374	298	
Loans only	100.0%	47.9%	52.1%	
	146	70	76	
Grants, loans, work	100.0%	58.6%	41.4%	
	261	153	108	
Grants & Loans	100.0%	41.8%	58.2%	
	481	201	280	
Other	100.0%	54.8%	45.2%	
	259	142	117	

Path Analyses

Table 4 summarizes the total effects of each of the predictor variables on persistence to bachelor's degree completion. Tables 5 through 9 show the direct, indirect, and total effects of the predictor variables on persistence. Regardless of the way financial aid is measured, college grades have the largest total effect upon persistence to bachelor's degree completion. Students living on campus, with higher degree goals, with higher admissions test scores, who were female, and who were attending the most selective colleges and universities were also more likely to have earned bachelor's degrees within five years of initial enrollment than other students. The number of hours worked, parents' education, socioeconomic status, attending the first-choice institution, distance from home, and total institutional enrollment were not directly related to persistence regardless of the way in which financial aid was measured.

The total effects of financial aid upon persistence were small in magnitude regardless of the measurement of financial aid. Receiving financial aid and the amount of aid received each had the eighth largest total effects upon persistence. Neither receiving financial aid nor the amount of financial aid received influenced persistence directly. About one-third of the total effect of receiving financial aid (36%) and of the amount of aid received (31%) was exerted indirectly through college grades.

The path analyses suggest that the effect of financial aid upon persistence depends upon the type and package of financial aid received. Receiving grants had the 9th largest total effect, receiving loans had the 13th largest total effect (negative), and receiving work study had the 15th largest total effect. When measured as the type of aid received, neither receiving grants nor receiving loans was directly related to persistence. Only receiving work study had a positive direct effect on persistence. Aid packages limited to grants had the 6th largest total effect. Receiving an aid package comprised of only grants was positively related to persistence directly as well as indirectly through college grades.

Table 4. Total effects of predictor variables on persistence to bachelor's degree completion

Predictor	Received Aid	Rank	Amount of Aid	Rank	Type of Aid	Rank	Aid Package	Rank
Received aid	0.065	8						
Amount of aid			0.058	8				
Received loans					-0.041	13		
Received grants					0.058	9		
Received work					0.037	15		
Only grants							0.083	6
Grant, loan, work							0.041	15
Grant & Loan							-0.002	28
Other package							0.045	12
GPA	0.226	1	0.228	1	0.228	1	0.225	1
Reside on campus	0.136	2	0.135	2	0.140	2	0.140	2
Expect more BA	0.108	3	0.105	3	0.106	3	0.108	3
Test score	0.106	4	0.104	4	0.106	4	0.103	4
Female	0.103	5	0.104	5	0.102	5	0.099	5
Very competitive instn	0.082	6	0.077	6	0.080	6	0.083	7
Social integration	0.071	7	0.071	7	0.072	7	0.072	8
Non-competitive instn	-0.059	9	-0.056	9	-0.059	8	-0.060	9
Academic integration	0.046	12	0.046	12	0.047	12	0.046	10
4th SES	0.054	10	0.051	10	0.048	10	0.045	11
3rd SES	0.049	11	0.048	11	0.047	11	0.044	13
Total enrollment	-0.040	13	-0.037	13	-0.041	14	-0.042	14
11-50 miles from home	0.034	14	0.034	14	0.034	17	0.035	16
Other race	0.033	15	0.033	16	0.035	16	0.033	17
Parents' education	0.033	16	0.033	15	0.030	18	0.029	18
2nd SES	0.020	18	0.021	17	0.022	19	0.018	19
Work 1-15 hours	0.021	17	0.019	18	0.013	21	0.017	20
Hispanic	-0.014	19	-0.012	19	-0.014	20	-0.015	21
First choice	0.011	20	0.011	20	0.013	22	0.013	22
Work 35 or more hours	0.009	22	0.008	23	0.006	25	0.008	23
Work 16-20 hours	0.009	23	0.009	22	0.008	24	0.008	24
Black	-0.010	21	-0.010	21	-0.009	23	-0.008	25
10 miles or less	0.002	24	0.002	24	0.001	26	0.003	26
Work 21-34 hours	0.002	25	0.001	25	0.000	27	0.002	27

Table 5. Direct, Indirect, and Total Effects
Model 1: Financial aid measured as any aid received

		Indirect Effects			
Predictor	Direct Effects	GPA	Academic Integration	Social Integration	Total Effects
Received aid	0.032	0.024	0.005	0.005	0.065
Female	0.072***	0.033	0.002	-0.004	0.103
Black	-0.012	-0.002	0.004	0.001	-0.010
Hispanic	-0.008	-0.006	0.001	-0.001	-0.014
Other race	0.034*	-0.004	0.001	0.002	0.033
Parents' education	0.018	0.011	-0.002	0.006	0.033
2nd SES	0.016	-0.001	-0.002	0.007	0.020
3rd SES	0.042	-0.001	0.002	0.006	0.049
4th SES	0.038	0.004	0.005	0.008	0.054
Expect more BA	0.076***	0.021	0.003	0.008	0.108
First choice	0.013	-0.001	0.000	-0.002	0.011
Test score	0.048*	0.064	-0.003	-0.002	0.106
10 miles or less from home	-0.004	0.013	0.000	-0.006	0.002
11 to 50 miles from home	0.033	0.008	0.000	-0.007	0.034
Very competitive instn	0.069***	0.007	0.001	0.004	0.082
Non-competitive instn	-0.063**	0.005	0.001	-0.001	-0.059
Total enrollment	-0.018	-0.011	-0.008	-0.003	-0.040
Reside on campus	0.109***	0.006	0.003	0.018	0.136
Work 1-15 hours	0.015	0.000	0.003	0.003	0.021
Work 16-20 hours	0.006	-0.001	0.002	0.003	0.009
Work 21-34 hours	0.000	-0.005	0.002	0.004	0.002
Work 35 or more hours	0.004	-0.001	0.003	0.004	0.009
GPA	0.226***				0.226
Academic integration	0.046**				0.046
Social integration	0.071***				0.071
R^2	0.165	0.143	0.074	0.193	

*** p < .001, ** p < .01, * p < .05

Table 6. Direct, Indirect, and Total Effects
Model 2: Financial aid measured as amount of aid received

		Indirect Effects			
Predictor	Direct Effects	GPA	Academic Integration	Social Integration	Total Effects
Amount of aid	0.029	0.018	0.006	0.006	0.058
Female	0.072***	0.034	0.002	-0.004	0.104
Black	-0.013	-0.002	0.004	0.001	-0.010
Hispanic	-0.007	-0.005	0.001	-0.001	-0.012
Other race	0.034*	-0.004	0.001	0.002	0.033
Parents' education	0.018	0.011	-0.002	0.006	0.033
2nd SES	0.017	-0.001	-0.001	0.007	0.021
3rd SES	0.042	-0.002	0.002	0.007	0.048
4th SES	0.036	0.001	0.005	0.008	0.051
Expect more BA	0.075***	0.021	0.002	0.008	0.105
First choice	0.013	0.000	0.000	-0.002	0.011
Test score	0.047*	0.064	-0.004	-0.003	0.104
10 miles or less from home	-0.005	0.013	0.000	-0.006	0.002
11 to 50 miles from home	0.033	0.008	0.000	-0.007	0.034
Very competitive instn	0.067**	0.006	0.000	0.004	0.077
Non-competitive instn	-0.062**	0.005	0.001	0.000	-0.056
Total enrollment	-0.016	-0.010	-0.007	-0.003	-0.037
Reside on campus	0.109***	0.007	0.003	0.017	0.135
Work 1-15 hours	0.014	0.000	0.003	0.003	0.019
Work 16-20 hours	0.006	-0.001	0.002	0.003	0.009
Work 21-34 hours	0.000	-0.005	0.001	0.004	0.001
Work 35 or more hours	0.003	-0.001	0.002	0.004	0.008
GPA	0.228***	0.000	0.000	0.000	0.228
Academic integration	0.046**	0.000	0.000	0.000	0.046
Social integration	0.071***	0.000	0.000	0.000	0.071
R^2	0.165	0.138	0.078	0.194	

*** $p < .001$, ** $p < .01$, * $p < .05$

Table 7. Direct, Indirect, and Total Effects
Model 3: Financial aid measured as type of aid received

		Indirect Effects			
Predictor	Direct Effects	GPA	Academic Integration	Social Integration	Total Effects
Received loans	-0.023	-0.018	0.001	-0.001	-0.041
Received grants	0.013	0.035	0.004	0.007	0.058
Received work	0.040*	-0.004	0.001	-0.001	0.037
Female	0.071***	0.033	0.002	-0.004	0.102
Black	-0.011	-0.003	0.004	0.001	-0.009
Hispanic	-0.007	-0.007	0.001	-0.001	-0.014
Other race	0.034*	-0.003	0.001	0.002	0.035
Parents' education	0.016	0.010	-0.002	0.006	0.030
2nd SES	0.018	-0.001	-0.001	0.007	0.022
3rd SES	0.041	-0.002	0.002	0.007	0.047
4th SES	0.033	0.002	0.005	0.008	0.048
Expect more BA	0.075***	0.021	0.003	0.008	0.106
First choice	0.014	0.000	0.000	-0.002	0.013
Test score	0.049*	0.063	-0.003	-0.003	0.106
10 miles or less from home	-0.005	0.013	0.000	-0.007	0.001
11 to 50 miles from home	0.034	0.007	0.000	-0.007	0.034
Very competitive instn	0.068**	0.007	0.000	0.004	0.080
Non-competitive instn	-0.062**	0.003	0.001	-0.001	-0.059
Total enrollment	-0.018	-0.012	-0.008	-0.003	-0.041
Reside on campus	0.109***	0.009	0.003	0.018	0.140
Work 1-15 hours	0.005	0.003	0.003	0.003	0.013
Work 16-20 hours	0.003	0.000	0.002	0.003	0.008
Work 21-34 hours	-0.003	-0.003	0.001	0.005	0.000
Work 35 or more hours	0.001	-0.001	0.002	0.004	0.006
GPA	0.228***				0.228
Academic integration	0.047**				0.047
Social integration	0.072***				0.072
R^2	0.166	0.151	0.074	0.196	

*** $p < .001$, ** $p < .01$, * $p < .05$

Table 8. Direct, Indirect, and Total Effects
Model 4: Financial aid measured as package of aid received

Predictor	Direct Effects	Indirect Effects: GPA	Indirect Effects: Academic Integration	Indirect Effects: Social Integration	Total Effects
Only grants	0.040*	0.035	0.003	0.006	0.083
Grant, loan, work	0.036	-0.002	0.003	0.003	0.041
Grant & Loan	-0.018	0.009	0.004	0.004	-0.002
Other package	0.033	0.009	0.003	0.000	0.045
Female	0.069***	0.032	0.002	-0.004	0.099
Black	-0.010	-0.002	0.004	0.001	-0.008
Hispanic	-0.008	-0.006	0.001	-0.001	-0.015
Other race	0.033*	-0.003	0.001	0.002	0.033
Parents' education	0.016	0.010	-0.002	0.006	0.029
2nd SES	0.016	-0.003	-0.002	0.007	0.018
3rd SES	0.039	-0.004	0.002	0.007	0.044
4th SES	0.033	-0.001	0.005	0.008	0.045
Expect more BA	0.076***	0.021	0.003	0.008	0.108
First choice	0.015	0.000	0.000	-0.002	0.013
Test score	0.047*	0.062	-0.003	-0.003	0.103
10 miles or less from home	-0.003	0.013	0.000	-0.007	0.003
11 to 50 miles from home	0.034	0.008	0.000	-0.007	0.035
Very competitive instn	0.070***	0.009	0.001	0.004	0.083
Non-competitive instn	-0.062**	0.003	0.001	-0.001	-0.060
Total enrollment	-0.018	-0.013	-0.008	-0.003	-0.042
Reside on campus	0.110***	0.010	0.003	0.018	0.140
Work 1-15 hours	0.006	0.005	0.003	0.004	0.017
Work 16-20 hours	0.003	0.001	0.002	0.003	0.008
Work 21-34 hours	-0.002	-0.002	0.002	0.005	0.002
Work 35 or more hours	0.002	0.000	0.002	0.004	0.008
GPA	0.225***				0.225
Academic integration	0.046**				0.046
Social integration	0.072***				0.072
R^2	0.168	0.154	0.074	0.196	

*** p = .001, ** p = .01, * p = .05

CONCLUSIONS AND IMPLICATIONS

The BPS is intended to provide national data describing a number of important issues, including access, choice, enrollment, persistence, progress, curriculum, attainment, continuation into graduate or professional school, and rates of return to society. One of the questions the BPS is specifically designed to address is: "How and why do students continue their enrollment in PSE [postsecondary education]?" (National Center for Education Statistics, 1996, p. 2).

The analyses presented in this paper suggest that the usefulness of the BPS in fully answering this question is limited for at least three reasons. First, the model used in these analyses explains only about 17% of the variance in persistence to degree completion, 14% of the variance in college grades, 19% of the variance in social integration, and 7% of the variance in academic integration. Although the low R^2 may, in part, be attributable to the use of linear regression with a dichotomous outcome, the high proportion of unexplained variance suggests that the proxies that were used to measure some theoretically important variables were not adequate. Only one proxy for initial institutional commitment (attending first-choice institution) was available even though prior research shows that the most appropriate operationalization of institutional commitment has included a number of elements, such as confidence in the decision to attend the institution, importance of graduating from the institution, practical value of the education to secure employment, feeling of belonging at the institution, and friends' rating of institutional quality (Cabrera, Castañeda et al, 1992). Similarly, parental education was the only available proxy for encouragement of significant others. The absence of statistically significant effects for attending the first-choice institution and parental education on persistence suggest that these were inadequate proxies.

A second limitation pertains to the extent of missing data. About 13% percent of students who met the other sample selection criteria (financially dependent, U.S. citizens, initially enrolled in a four-year college or university full-time) were eliminated from the analyses because they were missing persistence data. One-third of the remaining cases were missing data for admissions test scores and 17%

were missing data for first-year college grades. While test score and college grade data were imputed to minimize the effects of missing data, this procedure results in an underestimation of standard errors by 10% to 20% and, as a result, the regression coefficients for these variables may falsely appear to be different from zero.

A third limitation pertains to the inadequacy of the variables used to construct composites of academic and social integration. The alpha reliability for both factors is modest (about 0.55), partially explaining the low percent of variance in academic integration (7%) and social integration (19%) that is explained by the model. Therefore, the analyses fail to reveal the extent to which financial aid truly influences academic and social integration and involvement in the institution and the extent to which academic and social integration may mediate the effects of financial aid on persistence.

Despite these limitations, several conclusions may be drawn. First, the results of this study suggest that receiving financial aid is not directly related to completing a bachelor's degree within five years. The analyses suggest, however, that the effectiveness of financial aid may depend upon the type and package of aid received. Receiving work study and receiving an aid package comprised of only grants both have positive direct effects upon persistence. Like some prior research (e.g., Nora, 1990; Cabrera, Nora et al, 1992), the results also suggest that the effects of financial aid are primarily exerted indirectly through college grades.

The negative total effect of receiving loans on bachelor's degree completion suggests that the shift in the emphasis of federal financial aid programs from grants to loans during the past two decades (The College Board, 1997) may have negatively influenced bachelor degree completion rates. In other words, the analyses suggest that students who receive loans are less likely to complete their degrees within five years than their counterparts who do not receive financial aid. From the perspective of both policymakers and college and university administrators, the reasons for the negative relationship between

loans and degree completion and the positive relationship between grants and degree completion warrants further investigation.

One explanation for the higher degree completion rates of students who receive grants and the lower degree completion rates for students who receive loans pertains to academic performance. The analyses show that students who receive grants have higher college grades than other students, students who receive loans have lower college grades, and college grades are the strongest predictor of degree completion. Future research should focus upon the reasons for these relationships. For example, are grants being awarded to students with greater academic potential and greater likelihood of completing their bachelor's degrees? Are loans being awarded to students with lower academic abilities and higher probabilities of dropping out? Does receiving grants increase and receiving loans decrease a student's motivation to succeed academically and progress to degree completion?

This study also shows that the number of hours worked while enrolled is unrelated to bachelor's degree completion but that receiving work study directly increases degree completion rates. Future research should explore the types of work undergraduates are performing and the ways in which both work study and off-campus employment may contribute to the persistence process. For instance, do students who work manage their time better than other students? Is the type of work in which students are engaged related to students' interest in their academic studies?

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